

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
15 April 2004 (15.04.2004)

PCT

(10) International Publication Number
WO 2004/032576 A1

(51) International Patent Classification⁷: **H05B 33/14**,
33/22, G02F 1/00

UZ, VC, VN, YU, ZA, ZM, ZW only): **KONINKLIJKE
PHILIPS ELECTRONICS N.V.** [NL/NL]; Groenewoud-
seweg 1, NL-5621 BA Eindhoven (NL).

(21) International Application Number:
PCT/IB2003/004116

(72) Inventors; and

(22) International Filing Date:
23 September 2003 (23.09.2003)

(75) Inventors/Applicants (for US only): **BOERNER, Her-
bert, Friedrich** [DE/DE]; c/o Philips Intellectual Property
& Standards GmbH, Weissshausstr. 2, 52066 Aachen (DE).
JÜSTEL, Thomas [DE/DE]; c/o Philips Intellectual Prop-
erty & Standards GmbH, Weissshausstr. 2, 52066 Aachen
(DE).

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
02102402.1 1 October 2002 (01.10.2002) EP

(74) Agent: **MEYER, Michael**; Philips Intellectual Property &
Standards GmbH, Weissshausstr. 2, 52066 Aachen (DE).

(71) Applicant (for DE only): **PHILIPS INTELLECTUAL
PROPERTY & STANDARDS GMBH** [DE/DE]; Stein-
damm 94, 20099 Hamburg (DE).

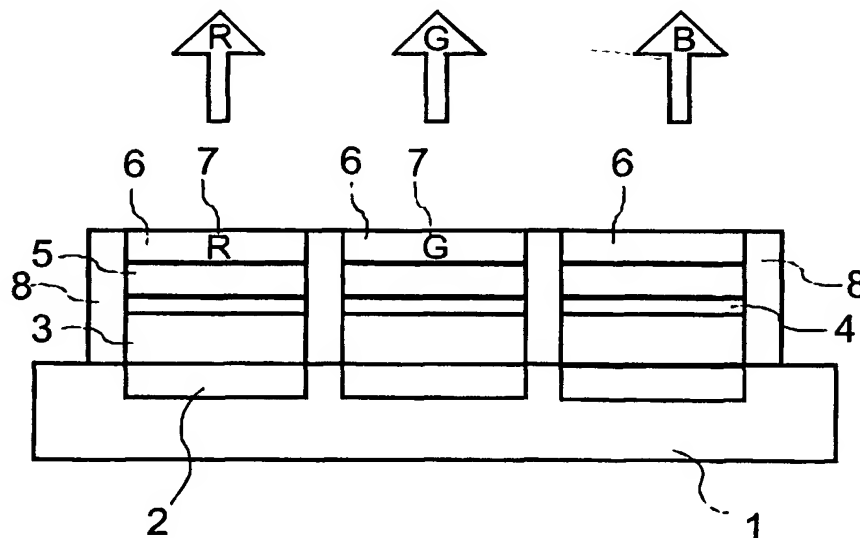
(81) Designated States (national): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC,
SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA,
UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(71) Applicant (for AE, AG, AL, AM, AT, AU, AZ, BA, BB, BE,
BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CY, CZ, DK,
DM, DZ, EC, EE, ES, FI, FR, GB, GD, GE, GH, GM, GR,
HR, HU, ID, IE, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX,
MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD,
SE, SG, SK, SL, SY, SZ, TJ, TM, TN, TR, TT, TZ, UA, UG,

(84) Designated States (regional): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),

[Continued on next page]

(54) Title: ELECTROLUMINESCENT DISPLAY WITH IMPROVED LIGHT OUTCOUPLING



(57) Abstract: A full color electroluminescent display is disclosed, the display including a common substrate and an array of electroluminescent devices disposed on the common substrate, wherein each of said electroluminescent devices comprises an electroluminescent layer that is sandwiched between a first and a second electrode, a color converting material that is capable of changing light emitted by the electroluminescent layer into light having a longer wavelength and a stack of $2n + 1$ transparent dielectric layers wherein $n = 0, 1, 2, 3, \dots$ and said transparent dielectric layers show alternating refractive indexes n . The electroluminescent display shows improved light outcoupling.



European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

— *with international search report*